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Surgery as a Science: The Intellectual and Practical Evolution of European Surgery from the 16th to the 18th century

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Surgery as a Science

In the early 15th century, surgery was a skill performed by barbers, in which limbs were hacked away or stitched together on the warfront, not a serious way to heal the sick. The Church thought surgery was a massacre of the body, which they believed to be a gift from God. The public and the Church also thought poorly of the practice because it usually caused lots of pain, there were low survival rates, and it usually left an un-whole result (since surgery usually meant the removal of something). Thereafter, public and church beliefs changed thanks to a higher rate of public autopsies to gain knowledge on the body, an increase in the teaching of surgery in universities, and a higher rate of book publications; so did the opinions of the physicians. By 1745, surgery had become a medical skill performed by physicians as evidenced by the first split between barbers and surgeons in London. What was left of the Company of Barber Surgeons in England, followed quickly by the other Barber-Surgeon guilds in Europe, immediately declined to what we know as barbers today. This thesis will outline the three main influences that caused surgery to evolve into a profession by 1745—technological advances, changes in public opinion, and the transformation of cultural beliefs—as well as explain how it is the change in public opinion that first caused the changes to occur during the early modern period.

Most historians have focused on the technological advances within surgery when trying to determine how surgery was transformed from a hacking of limbs to a respected skill.[1] With more modern tools and a better method of procedures, surgery became safer and more reliable procedure for patients. Tony Hunt and Roy Porter, historians of

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[1]Hunt, Tony. *The Medieval Surgery*. Woodbridge, Suffolk, UK: Boydell, 1992. Print.
Krebs, Robert E. *Groundbreaking Scientific Experiments, Inventions, and Discoveries of the Middle Ages and the Renaissance*. Westport, CT: Greenwood, 2004. Print.
McGrew, Roderick E., and Margaret P. McGrew. *Encyclopedia of Medical History*. New York: McGraw-Hill, 1985. Print.
Thompson, C. J. S. *The History and Evolution of Surgical Instruments*. New York: Schuman, 1942. Print.

medieval surgery and medicine, discuss the limited scope of technology that was available to barber surgeons by the dawn of the 16th century[2]. When a surgeon is on the battlefield sewing together limbs onto bodies, there can only be so much that can be done to save a person with the tools a surgeon can carry onto the field. Robert Krebs highlights that the pivotal point where surgery became more of a profession was during the time when technologies and surgical techniques widened during the invention and experimental boom of the Renaissance between the 16th and 17th centuries.[3] By looking at who, when, and where these surgical inventions abounded, I can see how the changes in society during this time coincided with these changes and see how successful they were in surgical culture. Although the advances in technologies were key to the transformation of surgery, it was not the only reason that led the skill to become promoted to a respectable profession.

This thesis will highlight some of the major technological inventions in the field of surgery during this time range, but more importantly will utilize the scarce resources available to piece together why these technologies did advance and how they played a role in the professionalization of surgery as a whole. The resources currently available to determine the advances in surgical tools and techniques either lack written descriptions of their uses, and are just picture books, or are beyond my ability to use since they are in foreign languages. Not only this, but there are no written works already published that focus specifically on this topic. I will answer the above proposed questions that have not been tackled by any historian before to determine how technology and society together transformed surgery.

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[2] Hunt, Tony. *The Medieval Surgery*.

[3] Krebs, Robert E. *Groundbreaking Scientific Experiments, Inventions, and Discoveries of the Middle Ages and the Renaissance*.

Jesse Dobson and Robert Walker emphasize the rivalry between the Company of Barber Surgeons and the Company of Physicians that started to appear in the last quarter of the 1400's[4]. As barbers became more popular in medical society, physicians tried to take away their right to practice certain types of medicine so demand a prestige for physicians stayed high while surgeons kept a lower social status.[5] Although historians review the way surgeons interacted with other types of healers in early modern Europe, they do not answer how and why the changes in the overall social standing for surgeons occurred. To determine how surgery evolved into a profession, we must look at the influence of multiple factions of society, how they impact surgery on their own, and also how they interact with each other to further influence its transformation.

In particular, I will focus on the change in public and church opinion towards surgery, and how the modernization of technology gave rise to better societal opinions about surgical practices. Technology could not advance on its own, so I will discuss the reasons that led to these inventors making these changes and the environmental shift in cultural thought towards the mysteries of the body that led for these inventions to build upon each other. By looking at the culture behind the technological advances, I will be able to illustrate that it was not just the inventions themselves, or the culture itself, that gave birth to an environment that allowed for surgery to become a profession.[6] Like the famous

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[4] Dobson, Jessie, and Robert Milnes Walker. *Barbers and Barber-surgeons of London: A History of the Barbers' and Barber-surgeons Companies.* Oxford: Blackwell Scientific Publications for the Worshipful of Barbers, 1979. Print.

[5] Young, Sidney. *The Annals of the Barber-surgeons of London.* AMS Ed. 1978. London: Blades, East & Blades, 1890. Print.

[6] Lindemann, Mary. *Medicine and Society in Early Modern Europe.* 2nd ed. Cambridge, UK: Cambridge UP, 2010. Print.

Lines, David A. "Reorganizing the Curriculum: Teachingand Learning in the University of Bologna, c. 1560–c. 1590." *History of Universities* (26). Oxford University Press, 2012

question, "Which came first, the chicken or the egg," I will be trying to answer the question, "which caused the professionalization of surgery, technology or culture?"

With the growth and popularity of surgery by as early as 1560, there was a higher demand for surgeons, which gave way to surgical courses being taught at medical school and more works being published on the subject.[7] I will be using the annals of the Company of Barber Surgeons of London and the written documentation of the University of Bologna to determine the extent in which surgery became a profession by the mid-18th century.[8] Specifically, the annals are the closest I can get to primary documentation that states how the barber surgeons acted and were accepted in society, and how their significance changed over time. The written curriculum of the University of Bologna from 1560-1590 will allow me to see how medical education changed as surgery became more prevalent in society, and what were the exact ways it became integrated into medical education. I will also use these texts to determine how surgery passed from the College of Barbers to the Company of Surgeons in 1745. Overall, it must be said that while some historians are distinct in giving reason for the professionalization of surgery, usually stating distinctly that either culture change or modernization of tools was the main reason behind it all, I strictly believe it was the intertwined relationship between technological advancements and societal opinion that inevitably allowed for surgery to grow into the respectable

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Putnam, George Haven. *Books and Their Makers during the Middle Ages; a Study of the Conditions of the Production and Distribution of Literature from the Fall of the Roman Empire to the Close of the Seventeenth Century*. New York: Hillary House, 1962. Print.

[7] Lines, David A. "Reorganizing the Curriculum: Teaching and Learning in the University of Bologna, c. 1560–c. 1590."

[8] Ibid.

Young, Sidney. *The Annals of the Barber-surgeons of London*.

profession we see it as today.[9] Up until the dawn of the 19th century there has been little interest or reason to keep documentation on surgery and surgeons all over Europe. It is because of this hole in evidence that I must turn to the few primary documents that survive and that could answer the questions I am posing in this thesis.

Advances in Technology

The profession of a surgeon did not exist in the 16th century as it does today; instead surgery was thought of as a group of skills certain men had to heal a person.[10] The defining line between the work of a physician and a barber surgeon, as surgeons were then called, was the placement of the wound or illness. A physician would handle anything that was happening on the surface of a body while anything imbedded or encased within the body was treated by a man with skills.[11] I say "treated by a man with skills" because very few barber surgeons lived and worked solely as barber surgeons. That is why they are called "barber surgeons," because most of the men who had the skills to cut out a kidney stone or stitch up a wound would also be the men who gave haircuts, assist with shaving, and other hand-focuses skills. Butchers were also sought out because they were known to be good with their hands since they cut meat and flesh on a daily basis.[12] Since barber surgeons usually held other various skills that benefitted the town, there were few actual tools used solely for surgical purposes. If something needed to be cut, anything in the vicinity that was

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[9]Dobson, Jessie, and Robert Milnes Walker. *Barbers and Barber-surgeons of London: A History of the Barbers' and Barber-surgeons Companies.*
Nuland, Sherwin B. "The Past Is Prologue: Surgeons Then and Now." *Journal of the American College of Surgeons* 186; 4(1998). Pp 457-465.
Thompson, C. J. S. *The History and Evolution of Surgical Instruments.*
[10] Lindemann, Mary. *Medicine and Society in Early Modern Europe.*
[11] Hunt, Tony. *The Medieval Surgery.*
[12] Porter, Roy. *Blood and Guts: A Short History of Medicine.*

sharp would do.[13]If a wound needed stitching, a simple needle and thread, sometimes string from gut was used, would suffice. The thought that barber surgeons did not strictly work as surgeons may be difficult for a citizen of modern society to wrap their head around. Since we are used to calling upon specialized doctors if we have knee problems or ailments of the eye, it difficult to fathom that if a person was injured in the 1500's, they would have to call on a man who had the best knowledge on how to set a broken leg or could perform surgery to get out a kidney stone. This idea is important to think about in the context of surgery itself because throughout most of the medieval era no one gave much thought to surgery because it was only a group of skills only a limited number of men knew in the area. Since not enough attention was drawn to its significance, surgery as a whole was not what we would call surgery today- it would be the skill of knowing how to pull a tooth or stitch up a wound.

Besides the local barber who could help if you were ailing, it was on the battlefield that surgery was mostly found during 1500 and 1600's (though most scene during times of war in the 1500's), and also where surgical tools and techniques were first used.[14] Men were hired to help the wounded, and it was because of the speed and agility needed to keep a patient alive that caused basic worker's tools to become surgical instruments.[15] A barber surgeon had to be prepared for both bows and arrows and cannon. As *A General System of Surgery* states, gunshot wounds (in the 1680's) are, "so much by the heat of the bullets as by the Rapidity with which they destroy the Parts, and the violence of the Symptoms is

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[13] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.*

[14] Hunt, Tony. *The Medieval Surgery.*

[15] Burns, RL. "The Medieval Crossbow as Surgical Instrument: An Illustrated Case History." *Bulletin of the New York Academy of Medicine.* Vol 48 No 8, September 1972

owing chiefly to this matter of wounding."[16] The battlefield seemed to glorify those that performed surgery, and mark them out in society. Barber surgeons were known because of the gory, painful, and depressing stories told by survivors on the battlefield, and since this was where surgery was mostly used, it became a feared skill by the common man. No one wanted to deal with surgery unless absolutely necessary because those that underwent surgery and were lucky enough to survive returned home with missing limbs or painful, scarring memories. The reputation of a barber surgeon, if they dealt heavily with surgery, was a grim one. This unacceptance in society because of the poor reputation of surgeons is an important reason surgery did not advance.

Although barber surgeons had the grim reputation on the battlefield, they were respected for being crafty and quick-thinking. Barber surgeons had to remember the rules of treating a gunshot wound, which included, "extracting all foreign Bodies, to stop the Heaemorrhage [sic], to promote Suppuration, and to encourage new flesh."[17]As Robert Burns states that surgeons at the turn of the 16th century were efficient in using anything they could get their hands on and turn them into tools of healing.[18] Since the invention and spread of more modern tools did not occur until the middle of that century, it was imperative for barber surgeons to think on the spot of means to save a patient. Harold Ellis sums up the mind of a surgeon prior to the Renaissance by stating their methodology of

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[16] Heister, Lorenz. *A general system of surgery in three parts : Containing the doctrine and management, I. Of wounds, fractures, luxations, tumours, and ulcers, of all kinds. II. Of the several operations performed on all parts of the body. III. Of the several bandages applied in all operations and disorders. The whole illustrated with thirty eight copper-plates, exhibiting all the operations, instruments, bandages, and improvements, according to the modern and most approved practice : to which is prefixed an introduction concerning the nature, origin, progress, and improvements of surgery : with such other preliminaries as are necessary to be known by the younger surgeons. Being a work of thirty years experience.* London: Printed for W. Innys at the West-End os St. Paul's, 1743. Print. P 51

[17] Ibid. pp 52

[18] Burns, RL. "The Medieval Crossbow as Surgical Instrument: An Illustrated Case History." *Bulletin of the New York Academy of Medicine.* Vol 48 No 8, September 1972

working as one in which they "saw what they believed."[19] A surgeon did not have a strong knowledge of the body at the turn of the 16th century, so whatever they saw, they would try and work with it with the tools they had at hand. In particular, Burns focuses on the use of the crossbow as a nifty way of removing arrowheads. While popular TV shows may illustrate that simply ripping out an arrow that is lodged in a shoulder or leg may be effortless, in reality a surgeon had to take into account the type of arrow, the position and location it is in, the composition of the arrowhead (and whether or not is was poisoned), and the complications brought on by bleeding, dirt, and pebbles. [20] Prior to the 16th century, the demanding issue at hand was how to staunch the bleeding while trying to extract the foreign object. Even up until the 1860's, arrow wounds carried a higher death toll than any other weapon.[21] In dire circumstances, the crossbow was used to extract an imbedded arrow by wiring the protruding end of the arrow to the hitch of the crossbow, then releasing the hitch very quickly and painfully to pull out the arrow. As shown in *The Contigas* from the late 13th century, the crossbow-extraction technique seemed like a reverse way of using the weapon-- it pulled in an arrow rather than releasing it. Even though I do not provide the images that illustrate this crossbow technique, one can image how gruesome and mutilating a process this would have been amongst the disarray of the battlefield. Not only would the patient have probably died from this kind of wound, but the onlookers would spread by word of mouth the horrors done by surgeons to try and keep someone alive. We must keep in mind that in the early 1500's it was the anecdotes most

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[19] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery*. Cambridge, UK: Cambridge UP, 2009. Print. p 32

[20] Burns, RL. "The Medieval Crossbow as Surgical Instrument: An Illustrated Case History." *Bulletin of the New York Academy of Medicine*. Vol 48 No 8, September 1972. p 988

[21] Ibid., p. 226.

individuals heard from witnesses that fed their animosity towards surgery. It was not as if barber surgeons were not aware of the reputation they had, they did try to hide their instruments and techniques from their patients. One such instance can be seen in the creation of issues, or small ulcers in the body, to regulate the health of the patient:

> "There is a second method of making Issues by wounding the Skin with a red-hot Iron or actual Cautery, which is usually in a sort of Capsula, or Case of Iron, to conceal it from terrifying the Patient."[22]

Just the mere fact that barber surgeons make holes in the skin of their patients to "heal them" is terrifying enough, but making these holes with red-hot irons or via cauterizing is horrible enough! Though the barber surgeon attempts to hide the terrifying truth from the patient, their reaction to this wounding would probably be scarring enough for them or an onlooker.

It was because surgery was thought so little of that men did not find it worthwhile to craft better surgical tools.[23] Since barber surgeons were mainly needed during sudden war or fighting, it was not worth the time or the effort for a barber surgeon to produce new tools for the trade when they had no idea when they would next be needed. Nor would it be profitable for a barber surgeon to test out new techniques if very few individuals would call on a barber surgeon for emergencies. The barber surgeons were the last resort, and they had neither the materials nor the opportunities to practice bettering their surgical craft.

When the invention of surgical tools started to boom in the latter half of the 1500's, it is mainly because of the introduction of more menacing weapons in battle, like cannons and gunpowder that barber surgeons really decide they need more efficient tools to save

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[22] Heister, Lorenz. *A general system of surgery...* P 314
[23] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.* P 70.

more lives. Firearms ripped apart limbs which had to be amputated, so scalpels once without handles by the end of the 15th century now included handles so a barber could cut more easily.[24] Saws better equipped for cutting through flesh and bone became more widely used for amputation.[25] By the 1560's more efficient adjustments to the saw were made, including the addition of a brace to steady the saw, screws to adjust them to the patient, and cogs to act as safety locks to reduce unnecessary accidents.[26] The speculum, invented by Guy de Chauliac, was upgraded in 1554 when a mirror was attached to it so when a wound or orifice was being studied, a surgeon was better able to see if a wound was infected by dirt or if a bullet was imbedded deep within.[27] This was a much more sterile way of inspecting a wound than the previously common technique of prodding and digging one's fingers into the wound. Even with minor adjustments made to tools, they allowed for more efficiency and precision for a surgeon. If surgical procedures were becoming more common and in higher demand, which they were by the end of the 1600's, then these newer tools would become more widely used, which did happen, and better help with the survival rate and opinion of patients.

Ambroise Paré was one of the first barber surgeons to modernize surgical tools and techniques.[28] Born in France in 1510, Paré followed the footsteps of his older brother and became a barber surgeon working for kings Henry II, Francis II, Charles IX, and Henry III. While he was working out on the battlefield during a campaign in 1536, Paré realized how pointless current surgery was for men wounded by firearms. Surgeons, at a loss, would cut

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[24] Thompson, C. J. S. *The History and Evolution of Surgical Instruments*. P 24.
[25] Ibid.
[26] Ibid. Pp 30-40.
[27] Ibid. P. 50.
[28] Drunker, Charles B. "Ambrose Pare and the Birth of the Gentle Art of Surgery." *Yale Journal of Biology and Medicine* 81 (2008). Pp 198-202.

the throats of the wounded then attempt to heal them. In disgust, Paré sought ways address wounds caused by cannon.[29] He successfully applied rose oil, egg whites, and turpentine on gunshot wounds which became one of his most widely used surgical techniques[30]. The mixture dates back to Roman times, yet the next day after applying it to a gunshot wound, the wounded men were able to sleep the night and their wounds were healing. In contrast, men who had boiling oil applied to their wounds, the earlier practice common throughout Europe, were feverish from a night of sleeplessness and pain, and the bullet wounds were swollen. This new way of cleaning out gunshot wounds became a widespread method most war surgeons started to use after word got out that this technique was much more successful than any other cleansing method they have used in the past. Paré also improved surgical tools including a contraption that held a bar-saw encased by blades with plates directed and secured by a screw apparatus and winch, which allowed for more accuracy and safety when cutting open a patient.[31] Although he himself did not create most of the surgical upgrades, his sympathy for the patient's pain and determination that he could improve their conditions spread to other major barber surgeons in Europe during the mid-1500's.[32]

While first improvement of tools in the wake of gunpowder and cannon became more popular during wars, the invention and general use of even better tools and techniques for surgeons coursed through Europe during the 16th and 17th centuries.[33] I believe it was due to the growing desire for knowledge that defined the Age of the

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[29] Drunker, Charles B. "Ambrose Pare and the Birth of the Gentle Art of Surgery." Pp 198-202.
[30] Porter R. *The Greatest Benefit to Mankind: A Medical History of Humanity*. New York: WW Norton and Company; 1999. p. 188
[31] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.* P. 50.
[32] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery.* Cambridge, UK: Cambridge UP, 2009. Print. P.45
[33] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.* P. 72

Renaissance that most likely caused this. For example, the forceps, a tool used by surgeons to help pull out a baby during difficult childbirth, or to pull out bullets and shrapnel was invented by a barber surgeon during the late 1500's. By the 17th century, forceps became one of the key instruments a surgeon had on his person at all times. They were later made in different shapes and sizes, smaller pincers used for bullet wounds and larger, more maneuverable ones that were used during birthing.[34] While the statistics of what barber surgeons used most is not an available tool for historians to use to see how successful technological advances became during this era, patterns can still be seen by the inventions that were made. The minute tweaks that created dozens of different types of forceps and scalpels all within a couple decades illustrates the fact that there were enough barber surgeons, or people interested in surgery, along with ample materials and funding, to test and create these wide array of tools. More improvements must have happened because of more interest towards surgery, which could not have happened unless people started to think more highly of barber surgeons or because surgery became more significant in society, or both.

Other aspects of surgery improved as well. Early surgery was often done either on the ground where the wounded soldier was found ("When you try to attempt the extraction of a Ball, or other extraneous Body, you should endeavor to place your Patient in the same situation that he was in at the time of receiving the Wound; for by frequent changes of situation, the Ball will easily bury itself.."[35]) or the patient was placed on a wooden scamnem, or "luxation table", where they were stretched either face up or face down.[36] By

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[34] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.*. P. 72
[35] Heister, Lorenz. *A general system of surgery...* P. 52.
[36] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.* P. 96.

the 17th and 18th centuries, it became common to use a kitchen or dinner table found in the patient's house.[37] Enough experience provided by an increase surgical demand allowed for surgeons to determine that luxation tables were not comfortable for a patient to lie on and they were not convenient for a surgeon to wheel around when making frequent trips all over a village or town. Other inventions included portable tables that were made of wood with padding on the top and had metal straps to restrain the patient during an operation.[38] It is interesting to see how something so overlooked as a patient's table underwent improvement during Early Modern Europe. These subtle advances in comfort were contributing factors that led to the popularization of surgeons, for why else would surgeons have the chance to develop their skill unless the demand for them increased and they had more of a chance to test their ideas?

Other surgical techniques evolved during the late 16th and 17th centuries, like blood-letting, one of the medical treatments that have stood the test of time for thousands of years. During the 14th and 15th centuries, blood-letting was done infrequently and very little was released.[39] By the 15th and 16th century, it became common to have astronomers (or physicians with some knowledge of astronomy) to read the stars to know where on the body to make an incision, how much blood to let, and how often to continue with the treatment.[40] By the 16th century, barber surgeons were the men to be called upon to do this task. As the General System of Surgery states, phlebotomy (or blood-letting) is, "the most general, performed in most parts of the Body, and by much the most frequent in use at this

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[37] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.* P. 96.
[38] Ibid.
[39] Porter, Roy. *Blood and Guts: A Short History of Medicine.* P. 200
[40] McGrew, Roderick E., and Margaret P. McGrew. *Encyclopedia of Medical History.* New York: McGraw-Hill, 1985. Print. P 46

present Day."[41] In the 1500's, the instrument that did the blood-letting was the fleam, a handheld instrument made of metal that had a handle with a small, sharp point protruding off of the end like a spike.[42] By the closing of the 1600's, the fleam evolved into a scarificater (maker of scars), a box instrument with many small blades available to make incisions almost like a modern day pocketknife with the practicality and usefulness it provided for a barber surgeon.[43] Pragmatism led to routine so by the time the 1700's rolled around blood-letting became a technique very popularly prescribed by physicians. It became so common that there became a career for men who held the cup or cupped their hands to collect the blood during a blood-letting. They became known as cuppers[44]. While the actual act of blood-letting did not undergo much development, the act of blood-letting became a more popular treatment, making surgical skills more in demand. Just by the fact that the tools used to let blood became more compact and transportable illustrates this notion that barber surgeons became more popular in everyday society. The use of cuppers says the same things, since the actual act of blood-letting was request so frequently that men were actually able to make a living by being a cupper.

Another huge advance that led to the professionalization of surgery was the use of anesthesia. Wine and opiates were popular during the Greek and Roman times to render patients unconscious during painful surgeries, but throughout the 1400's up to the beginning of the 16th century, the use of opiates was rare because most surgeons were unable to gain access to such medicines.[45] Instead, patients were lucky if they had access to

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[41] Heister, Lorenz. *A general system of surgery...* P 273.
[42] Thompson, C. J. S. *The History and Evolution of Surgical Instruments.*. P. 81.
[43] Ibid., P. 82.
[44] Ibid. P. 81.
[45] McGrew, Roderick E., and Margaret P. McGrew. *Encyclopedia of Medical History*. P 14.

enough wine to sedate them during a long and painful surgery. Roy Porter states, "Before the introduction of anesthesia in the 1840's, invasive surgery was limited in scope; lengthy operations, or ones demanding great precision, were out of the question."[46] Because modern anesthesia was not accessible until the 19th century, everyday surgery was limited to easy, small-scale and benign actions like dressing wounds, drawing teeth, lancing boils, trussing up ruptures and so forth.[47] No one would want to undergo surgery while conscious, so most patient of a barber surgeon was usually unhappy and unwilling to be worked on. The reputation for bringing pain besides the harmless tasks of pulling teeth and lancing boils meant that barber surgeons were not a welcome sight to other people.

The restriction to safer practices started to loosen at the beginning of the 1600's when the use of other ingredients other than alcohol to numb a patient became more available. Before the finding of ether as an anesthesia, opium was widely used if a surgeon had access to it.[48] During the 16th century, a soporific sponge was used as a more efficient anesthesia than wine or whiskey. Dipped in a mixture of opium, hyosayamine (a secondary metabolite found in certain plants that settles the stomach and GI tract), blackberries, lettuce seed, hemlock juice, mandragoria and ivy, the sponge was then dried in the sun until it needed to be used for a surgery, when to work its magic the surgeon just needed to soak it in water and apply the sponge to the patient's nose. [49] Other similar mixtures were used for the patient to either inhale or ingest. The main ingredient that they all had in common was opium.[50]

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[46] Porter, Roy. *Blood and Guts: A Short History of Medicine*. P 80.
[47] Ibid.
[48] McGrew, Roderick E., and Margaret P. McGrew. *Encyclopedia of Medical History*. P 15
[49] Ibid. P 14.
[50] Ibid. P 16.

If any of the above ingredients were hard to find in a particular area, a surgeon would cut off blood circulation in the carotid artery (main artery found in the head and neck) to cause the patient to lose consciousness.[51]This was an effective method for anesthesia, but how long the patient stayed under and whether or not the compression of the artery was too much for too long (thus causing more damage to the patient) was difficult to control. During the 18th century, it was also possible to bleed the patient to excess to cause them to faint[52]. This was not a good practice if there was going to be large amounts of blood loss anyways during the procedure. Needless to say, this was not a successful was to sedate a patient for a successful surgery nor was it a pleasing sight for those in the room witnessing the surgery.

Even though a successful anesthesia was introduced into society late in the 18th century, the other methods of sedation, brutal and uncontrollable as they may seem, did show the development of surgical skill. If there were enough barber surgeons that were able to test and pass along successful ways to calm a patient their knowledge, then historians can believe that the importance of surgery started to grow during the 16th and 17th centuries. Although methods like cutting off blood circulation or bleeding a patient unconscious sounds painful, at least it allowed patients to be asleep when they were getting cut open or having a limb removed. Sedation allowed for more complicated surgeries to be more successful since the surgeon did not have to worry about holding down a patient or think about the pain threshold the patient had that may cause their body to go into shock. If more complex surgeries were being done all over Europe, citizens could then think to call on a barber surgeon for healing if they know how useful surgery is for the survival of a

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McGrew, Roderick E., and Margaret P. McGrew. *Encyclopedia of Medical History*. P 15.
[52] Ibid. P 14.

loved one. An example of this can be seen in the journal of Timothy Clark, a student of physiology and surgery in 1670's when he discusses the clinical case of a man who lost his spleen after a suicide attempt:

> "[After finding the body] The constables were horrified, and left the man for dead, as they believed. For three days the wound remained without suture, but at last a surgeon was summoned. The surgeon replaced the intestines and cut away part of the omentum, along with the spleen. The man rapidly recovered from the effects of the wound and for the whole of the following year remained in good health and spirits."[53]

It is mentioned earlier on in the diary how the patient was put to sleep prior to the surgery. It goes to show that with such anesthesia the surgery was a grand success, allowing the patient to survive a trip to New England to start a new life.[54] This is just one of many clinical cases of complicated surgeries that were able to succeed thanks to the use of a more modern anesthesia. Overall, the varied types of anesthesia that cropped up for surgeons during the 16th, 17th and 18th centuries shows how much surgical activity has gone from being a necessary skill that some had to do to save people, to a successful profession.

The progression of tools and techniques for barber surgeons also supports the phenomenon that surgery was becoming a more accepted profession in society. If instruments evolve into more efficient and controllable tools, and better techniques led to more successful recoveries, then the public would start to see how important surgery was in society. Given what remains of these centuries, that is exactly what has happened. By the middle of the 1550's, as mentioned above, there was a huge boom in the invention, and widespread use, of new technologies an techniques that allowed for surgery to become more controllable and successful. Since so much happened so quickly, the modernization of

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[53] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery*. P.45
[54] Ibid.

tools cannot be looked at as just an expression of the changing times, but a continent-wide event in which the job of a barber surgeon was evolving into something more acceptable and necessary in society. As the next section will show, it was not just the tools themselves that evolved within the era, but the opinions and actions of the people themselves that helped to stimulate this outgrowth of invention. Since tools could not develop and new ideas could not have spread without people creating these ideas and tools, I think the modernization of surgical tools was not the first thing to influence the professionalization of surgery.

Changes in Public Opinion and Culture

Advances in surgical technology did not happen overnight, nor did it occur all on its own. It was the people behind the invention of new tools and techniques that fueled the evolution of surgery. Yet who were these people that invested time and energy into modernizing surgery? Why was there a strong burst in the evolution of the instruments and styles of surgery just mentioned? Something in society had to have changed to cause a gradual increase and investment in the procedures of surgery. In this section of this thesis, I will look at the different ways public opinion had changed towards the barber surgeons and their craft that constructed a new importance for surgery in the society of Early Modern Europe. In particular, I will look at how public opinion first opposed surgery, specifically the Church and the College of Physicians, and why this was so.[55] Then with the use of texts that focus on the intellectual advances of surgery, I will explain the change in

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[55] Dobson, Jessie, and Robert Milnes Walker. *Barbers and Barber-surgeons of London: A History of the Barbers' and Barber-surgeons Companies.* P. 180
Young, Sidney. *The Annals of the Barber-surgeons of London.*

cultural opinion from the mid-1500's up until 1745 which changed surgery into a widely accepted medical profession.[56] Looking back at the chicken and egg question, was it technology or cultural changes that first caused surgery to professionalize, this section will discuss how it was public opinion that seemed to have first caused the changes in culture and technology that led to the evolution of surgery.

Cultural change focuses on overall reactions of a culture or body in society. Changes in culture and the mutability of public opinion are two terms that have been used simultaneously, but I will be looking at each as a separate entity. First I will look at the transformation of public opinion to show that surgery has become a necessary component in culture by the late 1600's. This includes the acceptance of surgery into medical schools, the boom in surgical publications, and the creation of anatomical theaters. Then, I will discuss the ways in which barber surgeons fit into European culture in the early modern period by looking at the Company of Barber Surgeons and how the Company of Physicians react to them from 1500 to 1745. I will touch upon the changing ideology of the Church (and by church I mostly mean the clergy and the ruling bodies of the Christian faith) towards surgery. The above aspects of culture and how they change from the 16th to the 18th century will show how over time surgery became a necessary and significant part of society that allowed it to become its own career. Although the differences between culture and public opinion seem very fine, I argue that it is the modification of public opinion that

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[56] Krebs, Robert E. *Groundbreaking Scientific Experiments, Inventions, and Discoveries of the Middle Ages and the Renaissance.*
Lines, David A. "Reorganizing the Curriculum: Teaching and Learning in the University of Bologna, c. 1560 c. 1590."
Putnam, George Haven. *Books and Their Makers...*

really sparks the alterations of culture and technology to allow for surgery to become a profession.

In 1500, the opinion towards barber surgeons and their craft was a negative one all throughout Europe. The general opinion of physicians in northern Europe was that they, the physicians, were not true healers. They were just active consultants and were not active participants in the healing process.[57] Since the majority of barber surgeons were not educated around 1500, their craft was thought of as healing, but it was at a menial level below what European citizens thought was medicine. By 1660, when surgeons were getting more and more educated, the respect for barber surgeons exploded.[58] In Paris, surgeons respected the fact that physicians dominated the medical field, but the general population of barber surgeons grew at a steady rate.[59] In Germany, the opinion towards barber surgery held steady through the 19th century because medicine did not advance as quickly as it did in France and England. To the Germans, barber surgeons had a more acceptable role in medical society by filling the shoes of surgery that physicians did not care to use.[60] In the southern Mediterranean, the culture of Italy, Spain and France always left barber-surgeons out on the doorstep with other lowly careers.[61] However there was an exception within Italy. In Salerno, the medical hub of Europe for the past half century, physicians and surgeons were considered equals within the field of medicine and their education was not separated if either sort attended the University.[62] Given the fact that Salerno was the first medical school, it is not a shock that they were the first to follow through with the notion

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[57] McGrew, Roderick E., and Margaret P. McGrew. *Encyclopedia of Medical History*. P 30.
[58] Ibid.
[59] Ibid. P 31.
[60] Ibid.
[61] McGrew, Roderick E., and Margaret P. McGrew. P 32.
[62] Ibid.

that surgery was indeed a skill that fell under medicine, let alone a skill a man should attend school to learn.

Although there was an overall negative opinion towards surgery, as we have mentioned earlier, the 17th and 18th centuries saw a very fundamental change in public opinion towards surgery. Although most of the information I am using for this focuses strongly on the 17th and 18th centuries, I believe that the point of transition from a negative to a positive belief in surgical technique started early in the 16th century. Granted that there are not sources that strongly support the presence of a change in opinion, I think that it is the acceptance of public belief that came first, for if there was not a change in the heart of many individuals, then there could not have been a development of society that allowed for surgery to become necessary and there would not have been a growth in the population of people interested in studying and practicing surgery to develop better technology for more successful surgeries.

One of the major examples that illustrates there was a large change in professional opinion towards surgeons was the inclusion of surgical courses in the medical school at the University of Bologna. Barber surgeons were rarely educated at universities, more so educated from apprenticeships and experience, because most medical universities were for physicians. As previously mentioned, physicians did not look highly on surgery nor did they believe it should be considered a part of the field of medicine. However, whether it was due to the growth of surgical presence in society or because surgeons were now running anatomical theaters and dissections that changes were beginning to be seen in education. Particularly in the 1660's and 1670's when a terrible wave of the Plague hits England and most of Europe, physicians took up the experimentation of surgical techniques to

experiment and gain better information on the infectiousness of the Plague. Dr. Richard Mead of England wrote in his *Discourses* on the plague how he wanted to study how the plague and infection worked:

> "[I want to investigate] What the effect the bile [of an infected human] would have had, when taken in the Stomach of a Dog: and likewise, what the Result would have been of Injecting into the Veins, other Juices of the body, besides the Bile, and also Matter flowing from the Pestilential Ulcers: For it cannot be certainly concluded, that the Bile would have the same Effect, what ever [sic.] Way conveyed into the Body...And perhaps, on the other hand, some other Juices of the Body besides the Bile, particularly the Matter of the Buboes or Carbuncles, injected into the Veins, might have given the Disease; as we see Infection is communicated by the Matter of the Pustules in the Experiment of Inoculating of the Small-Pox."[63]

When Mead writes this, he is thinking both as a physician and a surgeon because he wants to inject human bile into a dog then study the composition of the dog's stomach and other organs after it has been killed and dissected. Although Mead wanted to determine how the infection acts upon the different humors of the body, which is something physicians solely focus on, the experiment is very surgical- based. This can be seen when he is talking about testing the effect of fluids being introduced intravenously, a method that was normally a surgeon's, yet he wants to see the physical affects that the different fluids have on a dog for better knowledge of a disease usually healed by a physician. This brief excerpt of his dedication in his *Discourses* definitely shows the mindset of a physician during the early 18th century; one in which the mind thinks both as a physician, but also as a surgeon.

Even prior to the outbreak of Plague in the 1600's, the University of Bologna was one of the first universities to start adding surgery to their medical curriculum. In 1560 discussion between professors at the university concluded that surgery should be introduced into courses, like theoretical medicine, since it was starting to show promise as a necessary

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[63] Mead. R. *A Short Discourse Concerning Pestilential Contagion, and the Methods to be used to Prevent it*. P 10

technique in the medical and anatomical world. It soon became such a critical point of study that it gained a class of its own, optional (like an elective in today's standards), but it was offered. By 1573, a surgical course became the only course available for students.[64] By the end of the 1580's, surgery by now was a core part of the medical curriculum at the University.[65] Even though this is just a snapshot at the changing curriculum at one university amongst the dozens of medical schools all over Europe, we can see how this Italian university (and many of the Italian medical curriculums were copied by those in Paris and England) noticed the importance of surgery as a medical field. Physicians were the lecturers and heads of the medical schools, so adding surgery as a medical course meant that physicians' opinions towards surgery had fundamentally changed in the late 1500's. This change of heart was most likely because of the success surgeons were having with better tools and techniques as well as gaining a necessary role in society. Because of this, I conclude that there was an overall change in the hearts of doctors which ultimately led to an accepted position for surgery in the medical world of Europe by the early 18th century.

As the opinions of medical professions started to change towards surgeons, the public started to recognize and support the surgical profession. In Paris, King Louis XIV became a major patron of surgery in the 17th and early 18th century. In 1724, the personal success of popular surgeon Georges Mareschal at the Charite Hospital in Paris lead to a government grant that established the School of Surgery in Paris (L' Ecole de Chirurgie).[66] Similarly, the medical school at the University of Edinburgh was one of the only

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[64] Lines, David A. "Reorganizing the Curriculum: Teaching and Learning in the University of Bologna, c. 1560–c. 1590". P 12.
[65] Ibid. Pg 14.
[66] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery*. P 46

universities, when the medical school was established in 1724, to include surgery as a field of study, allowing medical students to graduate with a degree in surgery. In 1731 the same Mareschal as previously mentioned had the funds to create the Royal Society of Surgery in 1748.[67] All of these examples show that surgery was gaining enough funds from the government and the public that they could create their own societies and schools. This meant that enough of the public had to have a positive opinion that recognized the importance of surgery to invest in it. This also means that surgery was becoming such a prestigious field in society that new rules and regulations made it necessary that surgeons had to be educated to be accepted in society. When once it was not thought appropriate that barber surgeons would get a degree in their surgical craft, it was now thought poorly if they did not. This goes to show that surgery, but the mid-1700's was finally an accepted and successful medical profession in early modern European society.

Another point to consider when thinking about the changing public opinion towards surgery is the growth of published texts on surgery. This is significant to public opinion because if there was more of a presence of surgical books and pamphlets in society, then there were learned and wealthy people who felt strong enough about the topic to write and pay for a surgeon's publication. Surgical texts did not start circulating in European society until the late 1500's during the growth of new findings on the human body and new surgical instruments. By the early 1600's, when surgeons had to become more educated to be accepted into the Company of Barber Surgeons, one of the ways they could gain knowledge on techniques and tools to use. However, these books that were first published did not mean they were full of accuracies. After the texts were circulating into society for a

[67] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery*. P 46.

while, more new ideas and findings caused more books to get published to provide more valid information for the growing surgical population at the dawn of the 1700's. One introduction to a surgical text validates this:

> "If any one examines the best Books, such as the *Microtechnia* of Van Hoorn, the *Operations* of Nucke ect, which were at the time consulted not only by our Surgeons but also by our University Professors for teaching and learning the Art, it will readily appear how imperfect and insufficient they are..."[68]

As the author of the *General System of Surgery* mentions, there are previous authors on the topic of surgery, but now that there have been more advances in this field, he has the resources and obligation to write a more contemporary work on surgery. In another text, the basics of surgery and the anatomy of the body are provided. For example, the definition of a nerve:

> "They are the Organs of Sence [sic], long, round, white Bodies, covered with two Membranes, made of the *Dura* and the *Pia Mater*, composed of Fibres. Springing from the Cortical part of the Brain and the *Cerebellum*"[69]

With surgical texts being published that show the basics of surgical skill and the definition of major components of the body, it can be seen that by the dawn of the 18th century (with this text in particular being published in 1705), that there is enough importance given to surgery that allows learned texts written by educated and successful surgeons to circulate throughout Europe.

There is significance in looking at the culture of surgical texts because the more interest people had in the field, the more likely there were patrons who invested in the publishing on textbooks. As George Putnam states, "The 15th century rediscovered (books

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[68] Heister, Lorenz. *A general system of surgery...* P vii.

[69] Handley, James. *Colloquia Chirurgica; or, the whole Art of Surgery epitomiz'd and made easie according to modern practice. ... To which is added a compendium of Anatomy*. London, 1705. P 174.

of the) antiquity, the 16th century was absorbed in slowly deciphering it."[70] While learned scholars and monks were spending time deciphering Greek and Roman texts, it took nearly another two centuries for the necessity of publishing surgical texts to occur. With new tools and new techniques circulating in the field of surgery, and with surgical skills starting to be highly prized thanks to the popularity of anatomy and anatomical theaters, the interest in surgery grew. By looking at the informational books that do survive from the era this thesis focuses on, most of the texts are published from 1675 onward. [71] The significance of this observation is twofold. First, that the field of surgery is now significant enough and necessary enough in society that people thought it profitable and worthwhile to publish solely on the topic. Secondly, that there was enough monetary investment in the publication of these books that multiple editions could be released (Lorenz Heister is one example, where the edition I used for this work was actually a third edition of the original text).

In the 14th and 15th centuries, physicians were the predominant healers in the medical field.[72] Although there were a strong number of uneducated healers in European society, these healers along with the educated physicians had one thing in common: they tried to heal a patient using their knowledge and mind, rather than their hands. As Roy Porter states, "The superior physician plumed himself as being marked out by mind, not muscle, brains not brawn."[73] For physicians, they counted in book-learning, experience,

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[70] Putnam, George Haven. *Books and Their Makers...* P 105
[71] This if from my experience in looking up primary resources. It is hard to say if it is factually true that the surgical texts that do remain are mostly from the late 1600's into the 1700's.
[72] Porter, Roy. *Blood and Guts: A Short History of Medicine*.P 30
[73] Ibid.

knowledge, memory and judgment. The common surgeon was depicted as a man of flesh--bold and beefy, holding a knife and a saw, no better than a butcher or a barber.[74] That is why many barber surgeons held many trades like hair-cutting, butchery, and used their hands for other useful jobs. The Hippocratic Oath itself directed physicians to leave knife-work to surgeons. While this recognized the skills of the surgeon, it bred a division of labor that endured for centuries-- surgery was inferior because it was the work of the hand, not of the head.[75] It was because of this mindset that surgery was an inferior skill to physician's work that kept surgery at the level of a barbaric skill rather than an esteemed profession.

The Church also had influence over the social standing of surgery in late medieval culture, and it was mostly because of this that surgery was unacceptable for so long in culture. To those of Christian faith, the body was pregnant with symbolic meanings. Since it was originally made in God's image, it was a sacred temple that held the mysteries of the Holy Spirit.[76] To gauge out limbs and hack away at the flesh and blood of God was thought to be an un-Christian thing to do. Thanks to the Renaissance, curiosity towards the world around us—and seeing how it worked—became accepted and esteemed in society. It was during the Renaissance that many Christian churches wanted to unfold the secrets of the body, and possibly find out where the soul was located in man.[77] Not only this, but large artistic projects, like the paintings within the Vatican done by Michelangelo and other artists focused on perfecting the art of painting the glorious human body.[78] To succeed in doing this, churches funded the construction of anatomical theaters where routine

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[74] Porter, Roy. *Blood and Guts: A Short History of Medicine*.P 30
[75] Ibid. P 78.
[76] Ibid. P 41
[77] Lindemann, Mary. *Medicine and Society in Early Modern Europe*. Pg 92.
[78] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery*. Pp 32

dissections were held and eager onlookers were able to sit and watch as barber surgeons, who were hired for the job of dissecting the cadavers, unraveled the mysteries of the human body. The incorporation of anatomical theaters into society meant that barber surgeons were now needed for their surgical skills to fulfill a needed role in society. This was also the first time that barber surgeons were creating a positive reputation for their work as surgeons. Barber surgeons were now being recognized by the learned of society as men who were not just skilled with their hands, but with the knowledge of the inner workings of the body.

Anatomical theaters also provided barber surgeons with the chance to show onlookers the importance of their work, which allowed them to gain their own niche in medical society. If someone watching a dissection was interested in finding out more about a certain part of the body, they could become patrons of barber surgeons. However, this was not as popular as the occurrence of wealthy and knowledgeable physicians who wanted to do more with their work. What emerged was a group called anatomists, who focused solely on specific parts of the body. For example, Andreas Vesalius became a world renowned anatomist in the 1540's because he was able to study the human body and determine that the works of Galen, an ancient physician whose writings were the cornerstone to medical education for centuries, was based on animal anatomy and not the anatomy of the human body. [79] Vesalius and many of his followers went on to discover how the circulatory system worked, where the organ lay in the body and what their purposes were, and many other eye-opening developments. The advances of anatomical research is one key to the success of barber surgeons because the new knowledge allowed for society

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[65] Lindemann, Mary. *Medicine and Society in Early Modern Europe*. P 92.

to see the importance of the inner workings of the body, but the novel information gave barber surgeons new ways to better treat their patients. If they are able to know what organ lies where and how it is important to the internal system of the body, then they can better diagnose and fix an ailing patient. Not only this, but knowing where the major arteries and veins are allows for better prevention of accidentally cutting a patient in the wrong spot. A good example of how this knowledge became successful can be seen in the anecdotes of Ambroise Paré:

> "A sergeant of the Chatelet got a sword thrust in the throat....It cut the external jugular vein completely across. As soon as he was injured he put a handkerchief on the wound and came to my house to find me. When he removed the handkerchief blood flowed very freely. I immediately tied the vein towards its root; thus it was staunched and he recovered, thanks to God. If you had followed your method of staunching the blood with cauteries (burning the vein to stop bleeding- the "old" way to staunch blood) , I wonder if he would have recovered. I believe he would have died in the hands of the operator."[80]

Thanks to the growing knowledge of human anatomy, Paré was able to save his patient by recognizing the vein that was cut by the sword, and he was able to use a modern technique of tying the vein instead of burning it to save his patient. This method was first tested out and successfully spread throughout Europe, soon replacing the once-common technique of cauterizing arteries. [81]

While it would be expected that the acceptance and place of barber surgeons in the 16th and 17th centuries differed amongst European countries, I will focus specifically on the role of barber-surgeons within English society to illustrate how barber surgeons eventually diverged and surgery became its own profession. Not only was the Company of Barber-Surgeons in London one of the largest of such companies in Europe, their interactions with

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[80] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery.* P 36
[81] Ibid.

the Company of Physicians and the general public over the centuries have been carefully documented and republished to make access to them easy.[82] I will be using these annals to generalize the relationship between barber surgeons and physicians during each century leading up to the separation and legalization of the Company of Surgeons in 1745. This year was pivotal because it marked the first time surgeons, in their own right, had a place in both society and medical culture. To me, it is the first real example of the professionalization of surgery.

If a group of men who had the same job within a large town during the 14th and 15th century, they usually formed a guild, or company, so they could monopolize that profession and regulate all those that have that career. In London, the Company of Barber Surgeons was first recognized when its first Master, Richard le Barber, was sworn into his position in 1308.[83] In 1451, the Company of Barbers was given the Grant of Arms to undertake surgery as a craft within their guild.[84] This meant that prior to 1451, any man could lawfully conduct surgeries because it was not a skill monitored under any particular company, but after 1451, any legitimate or accepted surgery had to be done by a sworn barber surgeon belonged to the Company of Barbers.

The barber surgeons were able to thrive because they were able to provide so many skills along with surgery, so citizens were not repulsed by a man because his sole career involved cutting open a man—a barber surgeon was able to provide haircuts and pull teeth.[85] As Sydney Young wrote:

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[82] Young, Sidney. *The Annals of the Barber-surgeons of London.* P 51.
[83] Ibid.
[84] Ibid.
[85] Ibid.

> "The Barbers by the regular and everyday nature of their calling as shavers and haircutters, together with the practice of surgery combined by so many of them, were the most likely to become the more popular Company; their fees would surely be on a lower scale than those of the more aristocratic surgeons and their number and constant intercourse with the citizens, in their capacity as barbers, enabled them easily to extend their connection as surgeons."[86]

As can be seen, barber surgeons flourished in London during the first half of the 1500's. During this time, most of the men that comprised the Company of Barbers were men that had little to no formal education in medical practices. This was why that it was not until 1540 that the Company of Physicians never really took notice of these men. All of this changed as early as 1525 and throughout the latter half of the 1500's when the Company of Physicians tried to uphold divisions over who within medical society could learn and practice certain types of "physic" (or medicine).[87]

It is not coincidental that as the Company of Barber Surgeons grew, which meant that more men were interested in the art of surgery and more men were needed in London to perform surgeries that physicians started to notice the barber surgeons. With a larger presence in society because of their role in anatomy, barber surgeons were now a threat to the physicians in the world of medicine, even though physicians still upheld the fact that there was a distinct difference between medicine and surgery. The middle of the 1500's also was the beginning of most of the major inventions and modernizations to surgical tools and techniques, which mean more people were comfortable with having surgery done or it may mean that more men were able to test out new inventions now there was a larger population within the Company. It could also mean that since more men were joining the Company of Barber Surgeons from all over England, they were able to spread their own

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[86] Young, Sidney. *The Annals of the Barber-surgeons of London.* P 51.
[87] Ibid. P 125.

techniques and tools more successfully. Either way, both ideas show that there was an increasing demand for surgery to allow for growth within the Company and with the techniques they used. This demand ultimately led to the professionalization of surgery by 1745.

All throughout the latter half of the 1500's subtle instances revealed the growing importance surgery held in society. The most widely seen ways were in the growing amounts of money the royal family and city of London kept demanding from the Company and the placement of barber surgeons in court. For example, in 1525, Henry VIII placed Thomas Vicary as the Surgeon to the King to help in trying to heal the King's ulcerous leg. During the reign of Elizabeth I, a royal surgeon was kept to help with the Queen's ailing teeth in the 1580's and in 1599, the royal household of Scotland recognized the Faculty of Physicians and Surgeons in Glasgow.[88] Now it was not only the physicians of medical society that were noticing the importance of surgery. These examples are just a few that reveal that surgery was now being observed and accepted into general society through the hiring of surgeons for the upper class. In the annals of the Company of Barber Surgeons, common minutes on the financial demands of the city are as follows:

> "29th March 1596. It was ordered that £40 'ship money' should be 'lent' by the Company to the City which is the earliest mention of this obnoxious tax in our books."[89]

It can be seen from this small notation in the annals that the barber surgeons knew, given the quotation marks around the word "lent" that the city was not going to return the forty pounds that was given to them. Because of this, they must have had enough money from their company to give away such money, or at least have access to people who could

[88] Ellis, Harold, and Harold Ellis. *The Cambridge Illustrated History of Surgery*.. P 36
[89] Young, Sidney. *The Annals of the Barber-surgeons of London*. P 107.

dispense the tax. Also, the last part of this note seems to show the tone of the barber surgeons, that they were either sick of the taxes put upon their company or they were tired of having to lend out money that was not being returned. The fact that the Company could still stay afloat for centuries while the city and the royal court are taking out so many loans shows that the Company of Barber Surgeons was prosperous enough to deal with it. If they could afford giving out such funds, then they must have either that enough members to rake in such revenue or they had ties to wealthy members/ patrons. Either way, the access to substantial funds to give away to court exemplifies the fact that the Company was now demanded enough in common society that they were able to have profits and connections to stay afloat.

While on the surface, it may seem strange to think that higher taxes and demands for money correlated with the rising significance of the society, but looking deeper, it certainly does. It was a compliment in a way that higher expectations were given to the Company from the royal family. If more and more men were becoming barber surgeons and joining the Company, than that meant there was a more money flowing into the guild that could be lent to the royal family and other needy subjects. Also, if the court started to rely on the barber surgeons for money, that must mean that they were gaining a reputation in London that the guild was stable enough financially to lend out funds. Some may say that the barber surgeons may have been demanding more money from their men so they could lend it to the crown, leading to bankruptcy (which did happen later in the 17th century), however if this were the case so early on in the second half of the 1500's, there would still have to be sufficient enough members in the guild, and many more added each year, that would be able to keep the Company afloat if membership funds would not suffice in the war

taxes and loans taken by the crown. If this were true, too, then it would have made the Company bankrupt sooner rather than later, and they would have been unable to build the anatomical theater that they did construct in 1636 for the advancement of surgery. The fact that the anatomical theater itself was built on the funds of the Company of Barber Surgeons shows the prosperity of the members, for if they were not growing rapidly in membership, then it would have been almost impossible for them to have afforded such a project. The culture of London must have changed substantially by 1636 from one that looked down on surgeons to one that needed them since the barber surgeons were prosperous enough to build the theater. Thus, surgery was becoming an acceptable medical profession from the skill it once was in 1500.

Thanks to the newly created anatomical theater and the growing attention paid to barber surgeons from court, the Company of Physicians recognized the threat of surgeons to the medical world. By 1677, the Company of Physicians submitted a charter trying to gain power over the Company of Barber Surgeons. Alarmed and determined to keep the divide between the work of physic (medicine) and the work of surgery, the barber surgeons petitioned the court to keep their freedom. To the dismay of the Company of Physicians, the barber surgeons won the petition. However, from 1677 until 1745, the Company of Physicians kept trying to gain the power to be in charge of surgery. With the skill of surgery now being taught in major medical schools by 1677, the physicians were constantly aware of the growing influence surgery was having both inside and outside the medical sphere, causing them to keep up their struggle for power. This continued effort to keep influence in medical society shows that surgeons were now gaining ground as a strong enough competitors as a medical profession.

It was also in the end of the 17th century that there becomes a noticeable divide in the Company of Barber Surgeon between the barbers and medically trained surgeons that were now coming out of medical schools. Rules were passed in the Company to keep an even distribution of barbers and surgeons in the seats of power within the guild. Of the four ruling "masters" in the Company, two had to be barbers and two had to be surgeons. This rule not only shows a rise in friction between the barbers and surgeons, since a formal law was needed to keep an even distribution in power, but it illustrates that there was now a large enough population of barber surgeons who solely worked as surgeons in society that had the voice to demand such a law to be instated. Written in the annals of the Company is a note that goes more in depth on the struggles between the barbers and the surgeons of the Company:

> "Jealousies arose in the Company in consequence of the more frequent election of Surgeons than Barbers, as Governors. The By-Laws required that every year there should be two Barbers and two Surgeons chosen (a Barber being defined as any member who did not practice Surgery). The Surgeons disregarded the law and the old custom, seem to have been able to procure the election of an undue number of members of their own craft to the offices of Master and Wardens...This altercation between the Barbers and the Surgeons was never forgotten, and indeed, helped to pave the way to further estrangement and the absolute separation in 1745 [this last sentence provided by Young himself]."[90]

This quote is a perfect example of how the barbers and surgeons were growing apart. The writer even notes the difference between what a barber is and what a surgeon is with the included parenthesis stating a barber did not practice surgery. This parenthetical notation also exemplifies the fact that at the end of the 17th century, when this note was written, that the surgeons had created successful professions from just being surgeons in the city of London. As Young includes in the last sentence, the barbers and the surgeons were never

[90] Young, Sidney. The Annals of the Barber-surgeons of London. P 149.

able to forget this event and it just added to the division that had cropped up between the two groups. The surgeons had gained more power and influence in the company (because they were gaining more seats) which could only mean that the surgeons were having a more important role in society since many now considered surgery a medical profession.

In 1686, a formal proposal was sent on behalf of the surgeons to the king petitioning him to allow their separation from the barbers. This declaration is important for two reasons. The surgeons were now strong enough to try and claim their independence from the barbers, but there was also enough of them in London to create such a petition. Obviously their demand for independence shows how surgery was now trying to fit itself into society as its own profession. The king did not accept their petition, but they kept trying to gain independence throughout the early 1700's while their influence as a majority of the governing body in the Company of Barber Surgeons kept growing. Finally in 1745, the Company of Surgeons was established while the Company of Barbers, now crippled with debt from loaning most of their money to the crown, diminished into what we know of barber's today—strictly hair cutters. [91] This shows that by 1745, surgery was a strong enough skill set that men were now able to get educated on the subject and practice it as a formal profession, since surgery was now its own trade guild.

The history of the London Company of Barber Surgeons is an important history to keep in mind when looking at the professionalization of surgery. First of all, the power dynamics between the Company of Physicians and the Company of Barber Surgeons as well as the internal struggles between barbers and surgeons by the end of the 1600's were seen in many of the major cities all over Europe. I focus specifically on the London companies

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[91] Young, Sidney. *The Annals of the Barber-surgeons of London*. Pp 154-155.

because their annals are easier to access and transcribe, but also because the splitting of the Company of Surgeons from the barber surgeons created a ripple effect all across Europe. Once the surgeons were well established in London, others in Paris, various provinces in Italy, and Spain took similar action and instated their own guilds[92].

Conclusion

Since the opinion of the public and the individual is the grassroots of cultural society that I believe it was what first changed to spark the professionalization of surgery during the early modern era. If an individual or group of individuals did not notice the importance of surgery, then culture would not have changed to accept surgery as a necessary part of society and better tools and methods would not have developed. However, these two other points of influence—the advances in technology and the change in culture—are also pivotal to the evolution of surgery from a set of skills into an accepted medical profession. As this thesis notes, it is because of all three that historians can see a drastic transition from the way surgery was though of practiced at the dawn of the 1500's, and how it ended up by 1745 when the London Company of Surgeons broke away from the Company of Barbers. Although this thesis briefly looks at only a few of the major players and groups that had a role in this evolution, its purpose has been to explain how and why the modernization of surgery has occurred in the first place, and why during the era between the 16th and the 18th centuries. It is important to look back at the creation of different professions to appreciate and acknowledge the way they now fit into society. With surgery now a competitive and respected profession in medical society, it is insightful to see how ideas

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[92] Young, Sidney. *The Annals of the Barber-surgeons of London*. P. xi.

and technologies have evolved to allow for such a profession to grow into significance in the modern world. It is also interesting to see how the interactions between surgeons and physicians played out in the past that caused them to stay two separate careers instead of one branching off from the other, or one professional being able to be both a doctor and a surgeon. While it may seem obsolete to look at the specific reasons that first caused the professionalization of surgery, it is important to keep in mind that similar patterns in society may be happening now to result in the creation of a whole new job or profession that may gain similar significance in society in the next generation. Thinking of the rapid advances in technology and opinion within the past century, similar results have come about for computer professionals and social media advisors. By looking at the reasons careers and professions come about, observers and historians can recognize the significance each has in the big picture of culture, society, and the world around us.

Future research will hopefully determine whether or not more documentation on the public opinion of Europe towards surgery does exist. If so, then historians can better piece together whether or not the conclusions I have drawn in this thesis are factual, which I believe they are, and whether or not it was an accepted opinion all over Europe, or just in certain social strata or geographical locations. While it remains unclear what was the real reason surgery evolved into a profession in the early modern era, at least we can better understand the various influences from different parts of society that brought forth one of the most essential professions we now hold in medical society.

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